Bluetooth Module Datasheet

-MOD02

Version V1.0

Content

Introduction

Overview

HY-MOD02 uses Dialog's DA14531 (2.2mm*3mm) chip as the core processor of the SMD low-power Bluetooth 5.1 module. The module adopts a high-precision four-layer board design, leads to DA14531 all users available IO, uses a ceramic antenna design, the module works in 2.4 GHz ISM Band with low power consumption, small size, long transmission distance, strong anti-interference ability and so on.

HY-MDO02 supports data throughput functions such as slave mode, normal broadcast mode, iBeacon mode, etc. It establishes Bluetooth two-way data communication between the MCU and the mobile phone APP through UART to help users without understanding the Bluetooth protocol stack. It can realize the intelligent upgrade of the product inside, and can also support the user's own secondary development, and directly write the application program into the programmable M0 core without the need of an external MCU to realize the product function. DA14531 has a 32-bit ARM Cortex M0 core with 512KB Flash+48KB RAM and BLE 5.1 Bluetooth protocol stack. The hardware has abundant analog and digital peripherals such as UART, I2C, SPI, PWM, ADC, etc., which can meet various design requirements.

Features:

- Chip model: Dailog14531.
- Chip core: ARM Cortex -M0 32 processor with FPU co-processor, clocked at 16 MHz.
- Storage space: 144KB ROM/48KB RAM/32K OTP.
- Transmitting power: -19.5 ~ +2.5dBm, the default is 0dBm.
- The highest sensitivity: -94dBm.
- BOOT time: 35ms (cold start to TX active state)
- Maximum number of connections: 3 (master or slave)
- Broadcast interval: 100ms-10s, the default is 100ms.
- Transmission distance: 100m.
- Support equipment: IOS7.0 and above, Android4.3 and above.
- Standby current: 2uA, average value.
- Sleep mode: 0.2uA.
- Protocol stack support: BLE5.1.
- Working temperature: -40-85°C.
- Storage temperature: -40-125°C.
- Peripheral interface: UART/SPI/I2C/PWM/ADC, etc.
- Physical rate: 1Mbps/2Mbps (default 1Mbps)

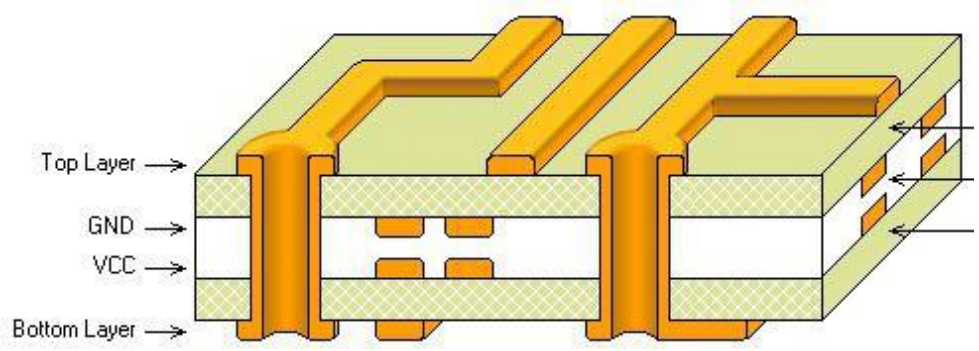
Applications:

- Bluetooth wireless data transmission, wireless data acquisition sensor
- Bluetooth and R2232 (RS485) serial data communication
- Bluetooth iBeacon
- smart Lock,
- Smart home
- Blood glucose meter,

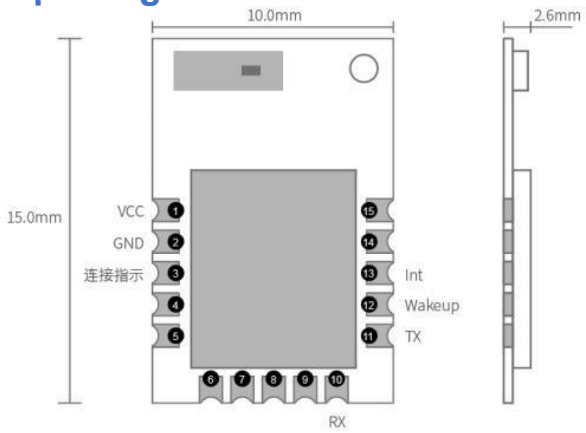
- sphygmomanometer,
- Heart rate monitoring equipment,
- Low frequency physiotherapy equipment
- Wearable device
- smart watch
- Fitness equipment wireless meter reading
- Industrial remote control
- Battery Management System BMS
- Vehicle OBD, TBOX, ambient light
- Bluetooth remote control, remote control toys
- Bluetooth alarm,
- Bluetooth printer
- Wireless remote control RGB light
- Measuring instrument
- Electronic painting screen, wireless billboard

Hardware Information

PCB info



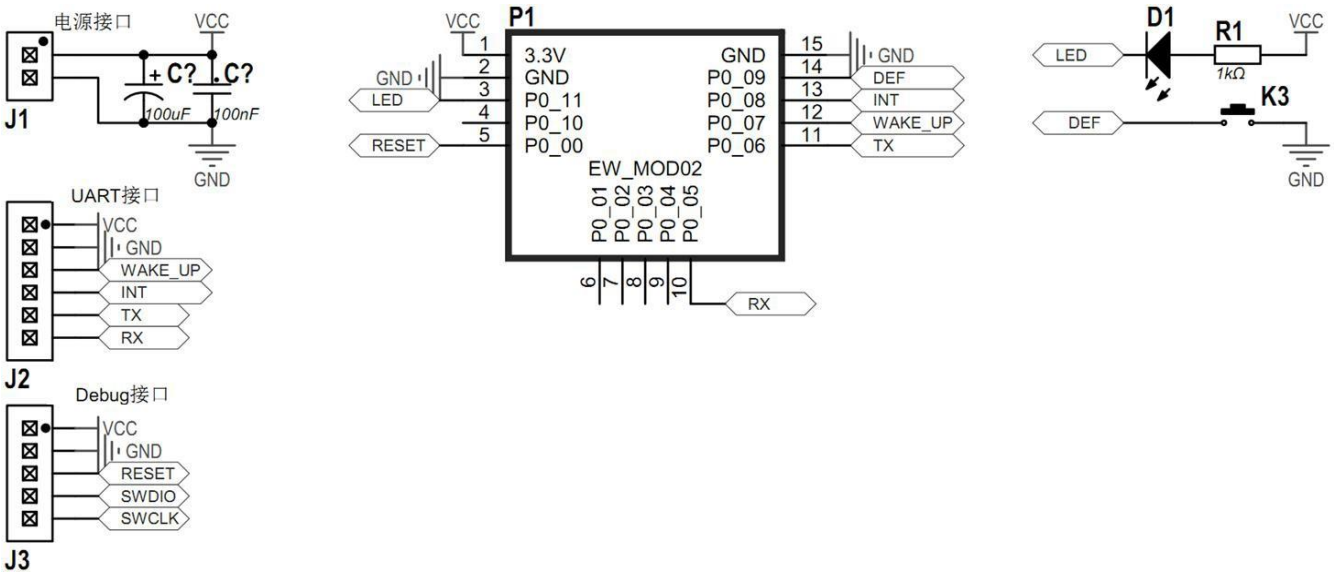
Module package size



Pin Definition

Pin No	Pin Name	Function	Throughput (default)	Throughput Function
1	VCC	VCC	VCC	Positive pole
2	GND	GND	GND	Negative pole
3	P11	GPIO	CONNECT(输出)	Connection indication, active low
4	P10	GPIO	RESET	RESET（Not yet open）
5	P00	GPIO	\	
6	P01	GPIO	\	
7	P02	GPIO	\	
8	P03	GPIO	\	
9	P04	GPIO	\	
10	P05	GPIO	RX	UART-RX
11	P06	GPIO	TX	UART-TX
12	P07	GPIO	WAKEUP	Module reception is allowed, low level is effective
13	P08	GPIO	INT	Module sending is allowed, low level is valid
14	P09	GPIO	SET DEFAULT	Restore the default configuration, active low (not yet open)
5	GND	GND	GND	Negative pole

Application Schematic



Consumption:

Broadcast Mode:

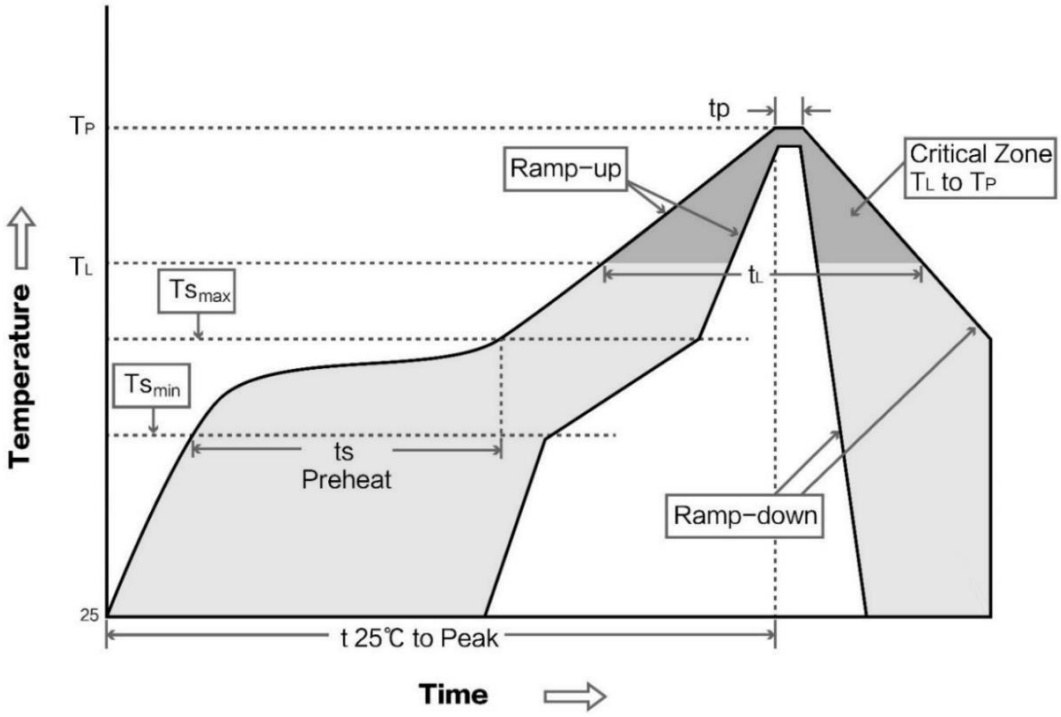
Tx Power:0dBm

Set Parameter	Broadcast Interval (ms)	Consumption (uA)	Set Parameter	Broadcast Interval (ms)	Consumption (uA)
32	20	263	960	600	13
64	40	147	1120	700	12
96	60	103	1280	800	10
128	80	81	1440	900	8
160	100（默认）	64	1600	1000	7
320	200	34	2400	1500	6
480	300	25	3200	2000	6
640	400	18	6400	4000	3
800	500	16	Close broadcast	-	

Broadcast Mode:

Parameter	Connect Interval（ms）	Connect Interval		Consumption (uA)
		Min	Max	
32	**20**	**32**	**34**	**66**
64	40	64	66	35
96	60	96	98	25
128	80	128	130	20
160	100 (Default)	160	160	16
320	200	320	322	11
480	300	480	482	8
640	400	640	642	7
800	500	800	802	7
1600	1000	960	962	6
2400	1500	1120	1122	6
3200	2000	1280	1282	6

Recommended Temperature Reflow Profile



characteristic curve	Sn-Pb	Pb-Free
Solder paste type	Sn63/Pb37	Sn96.5/Ag3/Cu0.5
Ts_{min}	100℃	150℃
Ts_{max}	150℃	200℃
Preheat time (ts)	60-120 sec	60-120 sec
Average ascent rate ($T_{p)}$	3℃/sec max	3℃/sec max
Liquidus temperature ($T_{L)}$	183℃	217℃
Time above liquidus	60-90 sec	30-90 sec

(t_L)		
Peak temperature (tp)	220-235℃	230-250℃
Average descent rate	6℃/sec max	6℃/sec max
Time from 25℃ to peak temperature	6 min max	8 min max